

MARK SCHEMES – Physics Unit 5 Homework

Q1 (a) the forces of the bike on the trailer and the trailer on the bike are equal in size
allow the force of tension acts on the bike and the trailer 1

and opposite in direction 1

(b) any **two** from:
• the same trailer should be used
• the weather conditions should be the same
allow a description of this, eg the wind should be the same
• the same road (surface) should be used
• the same gradient road should be used
• the same speed should be used
• the cyclist should be at the same level of alertness throughout the experiment
allow a description of a cause of this eg the cyclist should not drink coffee between experiments 2

(c) straight line drawn above the original line, sloping upwards 1

(d) the cyclist's reaction time increased 1

so the thinking distance increased 1

stopping distance is thinking distance plus braking distance 1

[8]

Q2 (a) any **two** from:
• length of coils increased
• increased gap between coils
• spring has become longer
• spring has become thinner 2

(b) **B and C**
either order 1

(c) weight = mass × gravitational field strength
allow $W = m g$ 1

(d) 5.5 (N)
allow any value in the range 5.0 to 5.8 (N) 1

up to that point force and extension are (directly) proportional
allow the line starts to curve 1

(e) use smaller intervals (for applied force)
allow any value for interval between 0.1 N and 0.2 N 1

between a total applied force of 5 to 6 Newtons 1

(f) force = spring constant \times extension 1

(g) 0.064 m 1

18×0.064 1

= 1.152 (N)
an answer of 1.152 (N) scores 3 marks
allow 115.2 (N) 1

[12]

Q3 (a) 0 (N) 1